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Abstract

Process intensification (PI) has the potential to improve existing processes or create new process options which are needed in order to produce products using more sustainable methods. Potentially, PI creates an enormous number of process options. For identification where and how the process should be intensified for biggest improvement, process synthesis and design tools are applied which results in the development of a systematic methodology incorporating PI. In order to manage the complexity of PI process options in which a feasible and optimal process solution may exist, the solution procedure of this methodology is based on the decomposition approach. Starting from an analysis of existing processes, this methodology generates a set of feasible process options and reduces their number through several screening steps until from the remaining feasible options, the optimal is found. In this presentation, the application of the computer-aided systematic synthesis and design methodology is highlighted via a case study which is the chemo-enzymatic synthesis of N-acetyl-D-neuraminic acid (Neu5Ac)).